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Final Hazardous Materials Removal and Abatement Work Plan
Absorbent Technologies Inc
140 Queen Avenue SW, Albany, Oregon

NRC Environmental Services is pleased to present the following draft Final Hazardous Materials Removal and Abatement Work Plan to complete the removal or abatement of residual hazards present in a number of systems on the Absorbent Technologies, Inc Queen Avenue project site, including the acrylonitrile tank/pump/vapor scrubber system, the Graft reactor, and the ceric ammonium nitrate tank/pump system.

1. Background:

NRC understands that previously-identified hazards associated with the chemical piping, co-polymer piping, starch slurry piping and other miscellaneous piping at the above-referenced ATI Queen Avenue site have now been assessed and/or abated (refer to the approved "Chemical Piping Re-Cleaning Work Plan, "Piping Demolition Work Plan", and "Non-Chemical Piping Assessment Work Plan").

This draft Final Hazardous Materials Removal and Abatement Work Plan is intended to address the remaining tanks, piping, pumps and carbon scrubbers on the property that have previously been identified as presenting a potential hazard based on their acrylonitrile contaminant levels or the potential for other residual products.

2. Acrylonitrile Vapor Scrubbing Carbon Filtration Units:

Three optional methods for removing acrylonitrile-contaminated activated carbon from the five carbon filtration vessels on site are presented here. A choice among these options will be made by EPA in conjunction with the property owners when additional information is available on the ignitability of spent carbon, the feasibility of management by carbon supplier Evoqua, the applicability of any EPA waste codes and the availability of a landfill disposal method through Waste Management. These options are listed in order of their desirability (i.e. Option 1 will likely be chosen if it is possible – if not, Option 2 will be chosen, defaulting to the next most desirable option only if the prior option is not available).

2.1. Option 1: Management by Carbon Supplier Evoqua

EPA, through their contractor EQM, has made contact with the supplier of activated carbon to the former ATI facility. NRC understands that there is a good likelihood that this material can be managed by the supplier, Evoqua, as a turn-key project. Little information has been made available at this time as to the details of carbon removal, but choice of this option is highest in desirability due to the management method (regeneration and re-use of spent carbon as opposed to landfill or incinerator disposal) and cost (Evoqua or their subcontractor is likely to be competitive in terms of cost due to use of their established system for removal and transportation of spent carbon).

One caution here is that the process of removal of carbon from the two units still in place near the acrylonitrile tank may generate significant acrylonitrile vapors, and details of that removal process should be obtained before approval is granted.

2.2. Option 2: Management by Landfill Disposal

In the event that the above-referenced management of spent carbon through supplier Evoqua is not chosen, the next most desirable option for removal and disposal of the acrylonitrile-contaminated carbon is through landfill disposal. This method is desirable because it limits handling of carbon on the ATI project site (and therefore potential exposures to the general public or site workers), and limits costs through cheaper transportation and disposal costs). This method will not be available if it is determined that spent carbon will be an EPA hazardous waste (carry any EPA waste codes) due to ignitability (D001), reactivity (D003), or the presence of acrylonitrile (U009). A summary of this management method is shown below:

a) Wearing Level B personal protective equipment, disconnect carbon unit from associated piping and install blind flanges or caps on all inlet/outlet piping;

b) Using a long-reach telescoping forklift, rig and lift carbon units and place in a roll-off bin for temporary storage, transportation and disposal;

c) Transport spent carbon vessels for landfill disposal at Chemical Waste Management's Arlington, Oregon facility, along with associated debris such as personal protective equipment.

2.3. Option 3: Management by Incineration

In the event that Options 1 and 2 are both unavailable, Option 3 consists of transferring spent carbon out of existing vessels into UN-rated containers for transportation to a chemical waste incinerator. To minimize acrylonitrile exposure, this activity is proposed to be conducted at the Chemical Waste Management facility in Arlington, Oregon. The initial stages of this optional management method are similar to Option 2.

a) Wearing Level B personal protective equipment, disconnect carbon unit from associated piping and install blind flanges or caps on all inlet/outlet piping;

b) Using a long-reach telescoping forklift, rig and lift carbon units and place in a roll-off bin for temporary storage, transportation and disposal;

c) Transport spent carbon vessels on a hazardous waste manifest to Chemical Waste Management's Arlington, Oregon facility (CWM);

d) At the CWM facility, a work area will be constructed using plastic sheeting to contain spills;

e) Spent carbon will be vacuumed out of carbon vessels using a drum vacuum by a crew wearing Level B personal protective equipment;

f) The manifest will be changed to reflect that the waste materials are now being transported in drums, and drums will be transshipped for incineration at an approved facility.

3. **Graft Reactor Cleaning:**

Solidified material in the Graft reactor will be removed by a confined space entry tank cleaning crew in Level B personal protective equipment. The proposed cleaning protocols are presented in brief below:

a) Transfer standing surface water out of the containment area under the Graft reactor to adjacent containment;

b) Set up entry, retrieval and ventilation equipment at the top opening of the Graft reactor;

c) Enter the tank in Level B PPE to manually scrape, shovel or chip residual polymer material from interior surfaces, removing the material using buckets and placing in drums for temporary storage and profiling;

d) If necessary, use chipping guns, needle scalers or other mechanical means to loosen and remove hardened residue;

e) After completion of manual removal of residue, pressure wash interior reactor surfaces, removing rinse water with a drum vacuum;

f) Check acrylonitrile levels in the reactor at the completion of cleaning activities, re-cleaning as needed to reduce acrylonitrile vapors below 2 ppm in interior areas of the reactor.

4. **Acrylonitrile Tank Re-Cleaning:**

Since residual acrylonitrile vapor was detected in the acrylonitrile tank headspace, additional cleaning will be necessary. The proposed cleaning protocol is presented below:

a) Set up entry, retrieval and ventilation equipment at the top opening of the Acrylonitrile reactor;

b) Clean all tank penetrations from the top of the tank using high-pressure line-mole equipment to rinse piping;

c) Enter the tank in Level B PPE (if necessary) to complete the cleaning of piping;

d) Remove rinse water with a vacuum truck or drum vacuum, placing wastes in drums for temporary storage and profiling;

e) Check acrylonitrile levels in the tank at the completion of cleaning activities, re-cleaning as needed to reduce acrylonitrile vapors below 2 ppm in interior areas of the reactor.

5. **Acrylonitrile Pump Removal and Disposal:**

Four small acrylonitrile pumps are in place in pump cabinets on or near the acrylonitrile tank. Surveying of these pumps for acrylonitrile indicated that some acrylonitrile vapor was present in the vicinity of these pumps. Dismantling and disposal of these pumps is indicated to remove this potential hazard to other site personnel. These four pumps will be disconnected and dismounted from their current placement and placed in a roll-off bin for proposed transport as non-RCRA regulated waste.

6. Ceric Ammonium Nitrate Tank System Cleaning:

Two small poly aboveground storage tanks are present in a cabinet near the acrylonitrile tank. The tanks are empty but are still connected to piping and pumps that connect to the Graft reactor. In the event that there is residual material in these small PVC lines, NRC proposes to remove the piping and pumps, wash the interior surfaces of the two small tanks, and remove standing water in the sub-surface pipe chase that leads from the tanks to the Graft reactor.

a) Disconnect and remove PVC piping and associated pumps, draining pumps to drums or other containers and placing piping and equipment in a roll-off bin for later transportation and disposal;

b) Remove standing water from pipe chase(s) with a drum vacuum;

c) Wash walls and floor of pipe chase with high-pressure washer, collecting wash water with a drum vacuum;

d) Wash interior of small tanks, collecting wash water in a basin below the tanks and transferring to drums for proposed transport as non-RCRA regulated waste.;

7. Waste Transportation and Disposal:

Waste materials determined to be non-RCRA regulated hazardous wastes will be profiled into a Subtitle D landfill such as Waste Management's Hillsboro Landfill. These materials will then be placed in lined roll-off bins and transported for disposal. NRC anticipates that materials which will likely be suitable for Subtitle D landfill disposal include the ceric ammonium nitrate piping and pumps, the acrylonitrile pumps, the co-polymer piping and the starch starch slurry piping.

This work plan assumes that the remaining wastes on site, including wash water from tank, reactor and pipe chase cleaning will be sampled, profiled and disposed of by others (presumably WasteXpress Environmental Services).

8. Health and Safety:

8.1. Air Monitoring:

NRC personnel will provide their own air monitoring equipment suitable for measuring acrylonitrile or other volatile organic compounds in ambient (breathing zone) air. Monitoring will be performed using a photoionization detector (PID) with 11.7 eV lamp. In the event that levels above 2 ppm are detected with the PID, additional readings will be made with acrylonitrile-specific colorimetric indicator tubes to allow the correct choice of PPE. Action levels for detected levels of acrylonitrile are listed in the table below.

8.2. Action Levels:

AIR MONITORING ACTION LEVELS		
Instrument: Colorimetric Indicator Tubes or PID	**Reading**	**Action**
Monitor ambient air in breathing zone of personnel engaged in tank/reactor entry and cleaning, or disassembly or cutting of various pump/piping systems	<2 PPM AN	• Safe for Level D PPE
	2-20 PPM AN	• Upgrade to Level C PPE
	>20 PPM AN	• Upgrade to Level B PPE

8.3. Personal Protective Equipment

Personal protective equipment listed in the above table of Action Levels is defined below.

- Modified Level D or Level C Personal Protective Equipment (PPE) is proposed as the minimum for use in the above-referenced activities, and includes the following at a minimum:
  - Hard hat
  - Saranex-coated Tyvek Coveralls
  - Inner Nitrile gloves
  - Outer PVC or butyl rubber gloves
  - PVC steel-toed boots
  - Face shield or optional full-face air-purifying respirator with organic vapor/acid-gas cartridges.
- Level C PPE consists of the above Level D PPE with the addition of a full-face air-purifying respirator with organic vapor/acid-gas cartridges.
- Level B PPE consists of the above Level D PPE with the addition of a supplied-air respiratory (SCBA or air-line) and substituting TyChem coveralls for the above-referenced Saranex-coated Tyvek coveralls.
- Additional PPE proposed for occasional use during site activities includes fall protection equipment (harness and lanyard) when working above 6 feet in height, and ear plugs when ambient noise is above 85 dB.

I appreciate the opportunity to provide you with this draft Final Hazardous Materials Removal and Abatement Work Plan. If you have any questions regarding this document, you can reach me via e-mail at rransdell@nrcc.com, or by cell phone at 503-209-2209.

Sincerely,

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